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10/577,336	04/28/2006	Andreas Luger	LUGER ET AL-1 PCT	5149
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EXAMINER				
BEHM, HARRY RAYMOND				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/577,336

**Applicant(s)**

LUGER ET AL.

**Examiner**

HARRY BEHM

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 April 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10-17 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 10-17 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 28 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/CS-100)  
Paper No(s)/Mail Date 4/28/06 and 3/12/08  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

The amendment to the specification received 4/28/06 is accepted, but a separate abstract is still required.

The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.

### ***Information Disclosure Statement***

The information disclosure statements (IDS) submitted on 3/12/08 and on 4/28/06 have been considered by the examiner. References cited as 2002/001210 and 2003/012038 on the IDS from 4/28/06 should have been 2002/0001210 and 2003/0012038.

### ***Claim Objections***

Claim 10 is objected to because of the following informalities: the claim language 'in particular' cited on line 1 and on lines 15-16 renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 10 is further objected to because it is unclear where the preamble ends and whether the transitional phrase is open or closed. For the purpose of examination, the claim language "in which", on line 3, is interpreted as the transitional phrase.

Claim 10 is further objected to since it is unclear what limitation is intended by the claim language "rectified again" on line 10, since the reference is to the first and only rectification.

Claims 10 and 16 are objected to because it is unclear what limitations are intended by detecting energy. Examiner has turned to the specification for clarification where detecting current is disclosed. For the purpose of examination, the claim has been interpreted as detecting current.

Appropriate correction is required.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a dead time set as a function of the detected energy, as in the last line of Claims 1 and 16, must be shown or the feature(s) canceled from the claim(s). Additionally, a frequency set as a function of the energy detected, as in Claim 17, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10 and 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakata (US 5,719,758) in view of Kuranuki (US 6,452,816).

With respect to Claim 10, Nakata discloses a method for a solar inverter (Fig. 1 1) for feeding energy produced by a d.c. voltage source (Fig. 1 2) into an a.c. voltage grid (Fig. 1 3), in which

the energy produced by the d.c. voltage source (Fig. 1 2) is chopped in the form of a pulse width modulation by a bridge inverter (Fig. 1 5), by alternate switching of switching elements (Fig. 1 Q1-Q4) connected in parallel and connected in series, and

this chopped energy is transmitted via a transformer (Fig. 1 6) which is connected between the switching elements (Fig. 1 Q1-Q4) that are connected in series, whereupon the energy transmitted is rectified (Fig. 1 7) and fed into the a.c. voltage grid (Fig. 1 3) via a buck chopper (Fig. 1 9), wherein, for a power adaptation, the switching times of the switching elements (Fig. 1 Q1-Q4) of the bridge inverter (Fig. 1 5) are controlled.

Nakata does not disclose how the dead time should be determined for the switching elements (Fig. 1 Q1-Q4). Kuranaki discloses adjusting the dead time for a bridge inverter (Fig. 1 11-14) based upon the energy produced by the d.c. voltage source (Fig. 1 Vin), which is detected (Fig. 1 9) permanently [continuously], and in that a dead time (Fig. 6 Dead Time) of the switching elements (Fig. 1 11-14) of the bridge inverter is set as a function of the detected energy [sensed current] of the d.c. voltage source (Fig. 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the dead time of the bridge inverter based upon the sensed current to the bridge inverter. The reason for doing so is to reduce "the switching loss in the light-load period and suppresses the occurrence of surge current and voltage, thereby realizing efficiency improvement and noise suppression", (Kuranaki column 4, lines 2-6).

With respect to Claim 12, Nakata in view of Kuranuki discloses a method as set forth above wherein the dead time, and thus the switching times, are automatically based on the sensed primary current from the dc source.

With respect to Claim 13, Nakata in view of Kuranuki discloses a method as set forth above. See claim 12 for details.

With respect to Claim 14, Nakata in view of Kuranuki discloses a method as set forth above wherein the dead time, and thus switching times, of the switching elements are determined by the sensed primary current (Fig. 6 Time Average of Load Current).

With respect to Claim 15, Nakata in view of Kuranuki discloses a method as set forth above where in the switches are set appropriately.

With respect to Claim 16, Nakata in view of Kuranuki discloses a solar inverter. See claim 10 for additional details.

With respect to Claim 17, Nakata in view of Kuranuki discloses a solar inverter as set forth above. See claim 10 for additional details.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakata (US 5,719,758) in view of Kuranuki (US 6,452,816) and further in view of Yang (US 6,597,159).

With respect to Claim 11, Nakata in view of Kurunaki disclose a method as set forth above and do not disclose how the switching frequency is determined. Yang

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discloses adjusting the switching frequency based upon the sensed primary current. It would have been obvious to one of ordinary skill in the art at the time of the invention to lower the switching frequency at lighter load currents. The reason for doing so is "the frequency modulation in the PWM controller can reduce the power consumption of the power supply in light load and no load conditions", (Yang column 4, lines 15-19).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HARRY BEHM whose telephone number is (571)272-8929. The examiner can normally be reached on 7:00 am - 3:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Akm E. Ullah can be reached on (571) 272-2361. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry Behm/  
Examiner, Art Unit 2838

/Jeffrey L. Sterrett/  
Primary Examiner, Art Unit 2838